

**Parasitic Hymenoptera reared from *Callisto denticulella* (THNBG.)
(Lepidoptera, Gracillariidae)**

EDYTA GÓRSKA-DRABIK*, JOLANTA NAPIÓRKOWSKA-KOWALIK**

Department of Entomology, University of Life Science in Lublin,

Króla Leszczyńskiego 7, 20-069 Lublin, Poland

e-mails: * edyta.drabik@up.lublin.pl, ** jolanta.napiorkowska@up.lublin.pl

ABSTRACT. Ten hymenopteran species of the family Ichneumonidae (2 species) and superfamily Chalcidoidea (8 species) had been reared from cocoons of *Callisto denticulella* (THNBG.). Such parasitoids as *Gelis areator* (PANZ.), *Chrysocharis pentheus* WALK., *Pedobius saulius* WALK., *Dibrachys cavus* WALK., *Eupelmus fulvipes* FÖRSTER, *Eupelmus urozonus* DALMAN, *Eurytoma goidanichi* BOUČEK and *Parablastothrix montana* ERDŐS had not been reported from the host before. *E. fulvipes*, *E. goidanichi* and *P. montana* are species new to Poland.

KEY WORDS: *Callisto denticulella*, Lepidoptera, Hymenoptera parasitica, Ichneumonidae, Chalcidoidea.

INTRODUCTION

Parasitoids associated with mining moths are discussed in some comprehensive papers dating back to the 90-ties of the 20th century. The works have presented 65 species of Chalcidoidea (VIDAL & BUSZKO 1990), 29 species of Braconidae (MARCZAK & BUSZKO 1993) and 34 species of Ichneumonidae (SAWONIEWICZ & BUSZKO 1994), many of which are species new to the Polish fauna. Papers of ZAJANČKAUSKAS et al. (1979), KADŁUBOWSKI (1981) and GÓRSKA- DRABIK (2007) also treat about some mining moth species of orchards. The above works together with the here presented study indicate that parasitoids of leaf-miners have not been overexploited yet and new works are still contributing with descriptions of new species.

The aim of the present study was to determine the species composition of parasitoid communities of *C. denticulella*.

MATERIAL AND METHODS

The study was conducted during 2001-2003 at two sites located near Lublin (Poland). The sites were free from any chemical plant protection treatments.

Leonów orchard (UTM FB 19) – the site of 14 km-distance from Lublin with about 25 year-old apple trees. The orchard has not been pruned or fertilized since 1993.

Private orchard – the site in Marynin (UTM FB 07), 16 km away from Lublin. Apple trees grown there are several-decade old and have big, branched crowns.

A 25-cm-wide strip of corrugated cardboard was banded round the trunk, 30-60 cm above the ground. Bands were placed in May and removed in October. Over the study, a total number of 174 bands had been used.

The reared parasitoids were identified with the nomenclature following MEDVEDEV (1978, 1981).

The parasitoids reared are kept at the Department of Entomology, University of Life Science in Lublin.

RESULTS AND DISCUSSION

Rearing 1463 cocoons of *C. denticulella* resulted in obtaining 768 Hymenoptera parasitica individuals. They represented 10 species grouped in such families as Ichneumonidae (2 species), Eulophidae (2 species), Pteromalidae (2 species), Eupelmidae (2 species), Eurytomidae (1 species) and Encyrtidae (1 species) (Table 1).

Ichneumonidae

Gelis ? areator (PANZ.): 5 females, FB07, FB19. GÓRNY (1979) described the species from such leaf-miners as *Coleophora badiipennella* (DUP.), *Coleophora fuscedinella* ZELL., *Coleophora anatipennella* (HBN.). SAWONIEWICZ & BUSZKO (1994) have reared the hymenopteran from *Coleophora hemerobiella* (SCOP.), *Coleophora spiraeella* RBL., *Ocnerostoma friesei* SV., *Parornix angulifera* ZELL. and *Parornix carpinella* (FREY). It had been reported from *C. denticulella* by GÓRSKA-DRABIK (2007).

Diadegma lithocolletis HORST.: 2 females, 2 males, FB07. The species has been reared from the following mining moths: *Perittia herrichiella* (H.-S.), *Bucculatrix nigricomella* (ZELL.), *Phyllonorycter emberizaepennella* (BOUCHÉ), and *C. denticulella* (SAWONIEWICZ & BUSZKO 1994).

Table 1. A list of Hymenoptera parasitica reared from *Callisto denticulella* (THNBG.) based on literature data and the results of own investigations.

No.	Species	References	Own investigations
-1-	-2-	-3-	-4-
Ichneumonidae			
Pimplinae (=Ephialtinae)			
1.	<i>Scambus calobatus</i> (GRAVENHORST)	ZAJANČKAUSKAS et al. 1979 GÓRSKA-DRABIK 2007	
2.	<i>Scambus ? nucum</i> RATZEBURG	ZAJANČKAUSKAS et al. 1979	
Gelinae (=Cryptinae)			
3.	<i>Gelis ? areator</i> (PANZER)		+N
Campopleginae			
4.	<i>Diadegma lithocolletis</i> HORSTMANN	SAWONIEWICZ & BUSZKO 1994	+
5.	<i>Diadegma</i> sp. (aff. <i>germanica</i> HORSTMANN, aff. <i>rectificator</i> AUBERT)	GÓRSKA-DRABIK 2007	
6.	<i>Diadegma</i> sp. (aff. <i>neoapostata</i> HORSTMANN, aff. <i>crataegellae</i> THOMSON)	GÓRSKA-DRABIK 2007	
7.	<i>Enytus appositor</i> AUBERT	SAWONIEWICZ & BUSZKO 1994	
Braconidae			
Microgasterinae			
8.	<i>Apanteles xanthostigma</i> HALIDAY	ZAJANČKAUSKAS et al. 1979 GÓRSKA-DRABIK 2007	
9.	<i>Apanteles longicauda</i> WESMAEL	GÓRSKA-DRABIK 2007	
10.	<i>Apanteles bicolor</i> NEES	ZAJANČKAUSKAS et al. 1979 GÓRSKA-DRABIK 2007	
Chalcidoidea			
Eulophidae			
11.	<i>Achrysocharoides latreillei</i> CURTIS	GÓRSKA-DRABIK 2007	
12.	<i>Chrysocharis pentheus</i> (WALKER)		+N
13.	<i>Cirrospilus diallus</i> WALKER	GÓRSKA-DRABIK 2007	
14.	<i>Cirrospilus pictus</i> NEES	NOYES 2002 (in Gençer & SEVEN 2005)	
15.	<i>Elachertus inunctus</i> NEES	GÓRSKA-DRABIK 2007	
16.	<i>Pediobius saulius</i> WALKER		+N
17.	<i>Pnigalio pectinicornis</i> LINNAEUS	GÓRSKA-DRABIK 2007	
18.	<i>Pnigalio soemius</i> WALKER	GÓRSKA-DRABIK 2007	
19.	<i>Sympiesis acalle</i> WALKER	ZAJANČKAUSKAS et al. 1979 GÓRSKA-DRABIK 2007	
20.	<i>Sympiesis gordius</i> WALKER	ZAJANČKAUSKAS et al. 1979 GÓRSKA-DRABIK 2007	
21.	<i>Sympiesis sericeicornis</i> NEES	ZAJANČKAUSKAS et al. 1979 GÓRSKA-DRABIK 2007	
Pteromalidae			
22.	<i>Pteromalus semotus</i> (WALKER)	GÓRSKA-DRABIK 2007	+
23.	<i>Dibrachys cavus</i> (WALKER)		+N

-1-	-2-	-3-	-4-
24.	<i>Mesopolobus subfumatus</i> RATZBURG	ZAJANČKAUSKAS et al. 1979	
Eupelmidae			
25.	<i>Eupelmus fulvipes</i> FÖRSTER		+N, NP
26.	<i>Eupelmus urozonus</i> DALMAN		+N
Eurytomidae			
27.	<i>Eurytoma goidanichi</i> BOUČEK		+N, NP
Encyrtidae			
28.	<i>Parablastothrix montana</i> ERDÖS		+N, NP

N- first record from *C. denticulella* (THNBG.)

NP- new species for the Polish fauna

Eulophidae

Chrysocaris pentheus (WALK.): 532 females, 7 males, FB07, FB19. *Ch. pentheus* is a parasitoid of different leaf-miners, associated mainly with Lepidoptera from Nepticulidae, Gracillariidae families (HANSSON 1985, MEDVEDEV 1978). Reported from mining moths – *Stigmella floslactella* (HAW.) by SZCZEPĀNSKI (1983), *Fomoria septembrella* (STT.), *Leucoptera laburnella* (STT.), *Leucoptera lustratella* (H.-S.) and *Ectodemia agrimoniae* (FREY) by VIDAL & BUSZKO (1990). ADACHI (1998) reported the species from *Lyonetia clerkella* (L.). It has not been described from *C. denticulella*.

Pediobius saulius (WALK.): 2 females, 1 male, FB07. Larval endoparasitoid of species from Gracillariidae, Bucculatrigidae, Gelechiidae or, occasionally hiperparasitoid (MEDVEDEV 1978). Reared from such mining moths as *Phyllonorycter blancaudella* (FABR.) (KADŁUBOWSKI 1981, BALÁZS 1997), *Phyllonorycter platani* (STGR.) (VIDAL & BUSZKO 1990), *Phyllonorycter robinella* (CLEMENS) (STOJANOVIC & MARKOVIĆ 2005), *Tischeria* sp. (NIKITENKO et al. 2005) and *Cameraria ohridella* (Deschka et DIMITIĆ) (HORVÁTH 2006).

Pteromalidae

Pteromalus semotus WALK. (syn. *Habrocytus semotus* (WALK.): 1 female, 1 male, FB19. Either primary or secondary parasitoid of Braconidae (*Apanteles* sp.). The species was reported from the leaf-miner *Ph. blancaudella* (KADŁUBOWSKI 1981) as well as from *C. hemerobiella*, *Coleophora saponariella* HEEG. and *Tischeria heinemanni* WOCHE (VIDAL & BUSZKO 1990). It was reported from *C. denticulella* by GÓRSKA-DRABIK (2007).

Dibrachys cavus (WALK.): 74 females, 46 males, FB07, FB19. Either primary or secondary parasitoid. Reported from many families of moths (ZAJANČKAUSKAS et al. 1979, KADŁUBOWSKI & SZMIT 1985, WINIARSKA & ANASIEWICZ 1989, BALÁZS 1997, ANDRIESCU & MITROIU 2004). Obtained from *Apanteles glomeratus* L. as hiperparasitoid (WIĄCZKOWSKI & WIĄCZKOWSKA 1961).

Eupelmidae

Eupelmus fulvipes Förster: 1 female, FB19. The parasitoid of Lepidoptera (Pieridae) (<http://www.nhm.ac.uk/jdsml/research-curation/research/projects/chalcidoids/>). It has not been reported from *C. denticulella*.

Eupelmus urozonus Dalman: 15 females, 8 males, FB07, FB19. Known either as primary or secondary parasitoid of Lepidoptera (GÓRNY, 1979). Reported from *C. ohridella* (GRABENWEGER, 2004).

Eurytomidae

Eurytoma goidanichi BOUČEK: 35 females, 34 males, FB07, FB19. Known as hyperparasitoid of *Ph. robiniella* (STOJANOVIC & MARKOĆ 2005) and other families of moths (<http://www.nhm.ac.uk/jdsml/research-curation/research/projects/chalcidoids/>). It has not been reported from *C. denticulella*.

Encyrtidae

Parablastothrix montana ERDÖS: 2 females, FB07, FB19. The species obtained from the leaf-miner *Stigmella vimineticola* FREY (MEDVEDEV 1978). It has not been reported from *C. denticulella*.

A total number of 20 parasitic hymenopterans has been reported from *C. denticulella* (ZAJANČKAUSKAS et al. 1979, SAWONIEWICZ & BUSZKO 1994, GÓRSKA-DRABIK 2007). The present study contributed to the list with further 8 unrecorded species. *E. fulvipes*, *E. goidanichi* and *P. montana* are species new to Poland.

Acknowledgements

I would like to express my deep gratitude to Professor Bartłomiej MICZULSKI for the identification to species the parasitoids belonging to the order of *Hymenoptera parasitica*.

REFERENCES

ADACHI I. 1998. Hymenopterous parasitoids of the peach leafminer, *Lyonetia clerkella* (LINNAEUS) (Lepidoptera: Lyonetiidae). *Appl. Entomol. Zool.* **33**(2): 299-304.

ANDRIESCU I., MITROIU M. 2004. Notes on the pteromalid fauna (Hymenoptera: Vhalcidoidea, Pteromalidae) of Dobrogea, Romonia (II). *Analele Științifice ale Universității "AI.I. Cuza", Iași, s. Biologie animală*, L: 89-96.

BALÁZS K. 1997. The importance of parasitoids in apple orchards. *Biol. Agric. and Hortic.* **15**, 1-4: 123-129.

BOGDANOWICZ W., CHUDZICKA E., PILIPIUK I., SKIBIŃSKA E. 2007. Fauna Polski. Charakterystyka i wykaz gatunków. T.II. Mi IZ PAN. 505 pp.

GENÇER L., SEVEN S. 2005. Chalcidoid parasitoids of *Micrurapterix sophorivora* (Lepidoptera, Gracilariidae) in Kuluncak, Tutkey. *Phytoprotection*, **86**(2): 133-134.

GRABENWEGER G. 2004. Poor control of the horse chestnut leafminer, *Cameraria ohridella* (Lepidoptera, Gracillariidae), by native European parasitoids: a synchronization problem. *Eur. J. Entomol.*, **101**: 189-192.

GÓRNY S. 1979. Parasitic Hymenoptera on black alder, *Alnus glutinosa* (L.) Gaertn., near Ostróda, Poland, Pol. *Pismo Ent.*, **49**: 305-369. [In Polish].

GÓRSKA-DRABIK E. 2007. Hymenopteran parasitoids of leaf-mining moths (Lepidoptera) affecting apple trees in Lublin (SE Poland). *Pol. Pismo Ent.*, **76**(4): 353-360.

HANSSON C. 1985. Taxonomy and biology of the Palaearctic species of *Chrysocharis* Foerster, 1856 (Hymenoptera: Eulophidae). *Ent. Scand.*, Suppl. **26**: 1-130.

HORVÁTH B. 2006. Biology and parasitoid community of horse-chestnut leafminer (*Cameraria ohridella*) in Szigetköz. Theses of doctoral dissertation. University of West Hungary. Mosonmagyaróvár, 2006, 16 pp.

KADŁUBOWSKI W. 1981. The parasite complex of *Lithocolletis blancardella* (F.) (Lepidoptera, Gracillariidae) in western Poland, Pol. *Pismo Ent.*, **51**: 493-499. [In Poland].

KADŁUBOWSKI W., SZMYT J. 1985. Materiały do bionomii namiotnicy gruszkowej *Swammerdamia pyrella* (DE VILLERS 1789) Lep., Yponomeutidae, Roczn. Nauk Rol., Ser. E, 15: 119-127. [In Polish].

MARCZAK P., BUSZKO J. 1993. Braconid wasps (Hymenoptera, Braconidae) reared from mining Lepidoptera. *Wiad. Entomol.* 12, **4**: 259-272.

MEDVEDEV G.S. (ed.), 1978. Opredelitel nasekomykh evropejskoj časti SSSR, Nauka, T.III, cz. 2, Akademija Nauk SSSR, Leningrad, 756 pp. [In Russian].

MEDVEDEV G.S. (ed.). 1981. Opredelitel nasekomykh evropejskoj časti SSSR, Nauka, T. III, cz. 3: Akademija Nauk SSSR, Leningrad, 687 pp. [In Russian].

NIKITENKO G.N., FURSOV V.N., SVIRIDOV S.V., GUMOVSKY A.V., KOTENKO A.G., NAROLSKY N.B., TOLKANITS V.I. 2005. Dubova shirokominuyucha mil'ta inshchi minuyuchi luskokrili na dubi. Povidomlenya 3. Prirodni vorogi minuyuchikh shchidnikiv duba v Ukraini ta sumizhnikh teritoriyakh. *Vestnik zoologii*, **39**(4): 35-47. [In Russian, English abstract].

SAWONIEWICZ J., BUSZKO J. 1994. Ichneumonidae (Hymenoptera) reared from mining Lepidoptera in Poland, *Wiad. Entomol.*, **13**(1): 55-61. [In Polish].

STOJANOVIC A., MARKOĆIĆ Ć. 2005. Parasitoid complex of *Phyllonorycter robbiniella* (CLEMENS, 1859) (Lepidoptera, Gracillariidae) in Serbia, *J. Pest Sci.*, **78**: 109-114.

SZCZEPANSKI H. 1983. Chalcidoidea (Hymenoptera) in the forests of the Białowieża National Park, Pol. *Pismo Ent.*, 53: 147-178. [In Polish].

WIĄCKOWSKI S., WIĄCKOWSKA J. 1961. Results of cultivating parasites of orchard entomofauna. Part. II, Pol. *Pismo Ent.*, 31: 255-262. [In Polish, English summary].

WINIARSKA W., ANASIEWICZ A. 1989. Parasitic Hymenoptera reared from eggs and pupae hibernating within apple tree bark near Lublin. *Pol. Pismo Ent.*, **59**: 383-386.

VIDAL S., BUSZKO J. 1990. Studies on the mining Lepidoptera of Poland. VIII. Chalcidoid wasps reared from mining Lepidoptera (Hymenoptera, Chalcidoidea). *Pol. Pismo Ent.*, **60**: 73-103.

ZAJANČKAUSKAS P., JONAITIS V., JAKIMAVIČIUS A., STANIONYTE S., 1979. Entomoparazity nasekomych vrediteljej sada Litwy. Vilnius (Mokslas). 163 pp. [In Russian].

<http://www.nhm.ac.uk/jdsml/research-curation/research/projects/chalcidoids/>

Received: January 14, 2009

Accepted: Mach 13, 2009